Performance Comparison of 10G-Class Partial Response Multilevel Modulation Formats in Access Network Scenarios with Limited Electronic Bandwidth

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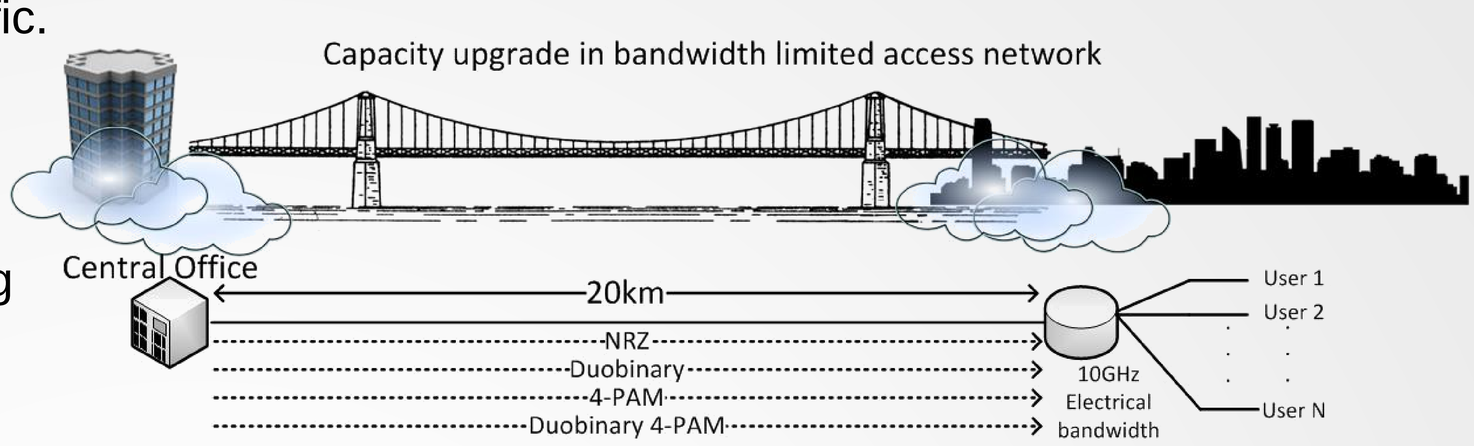
Introduction

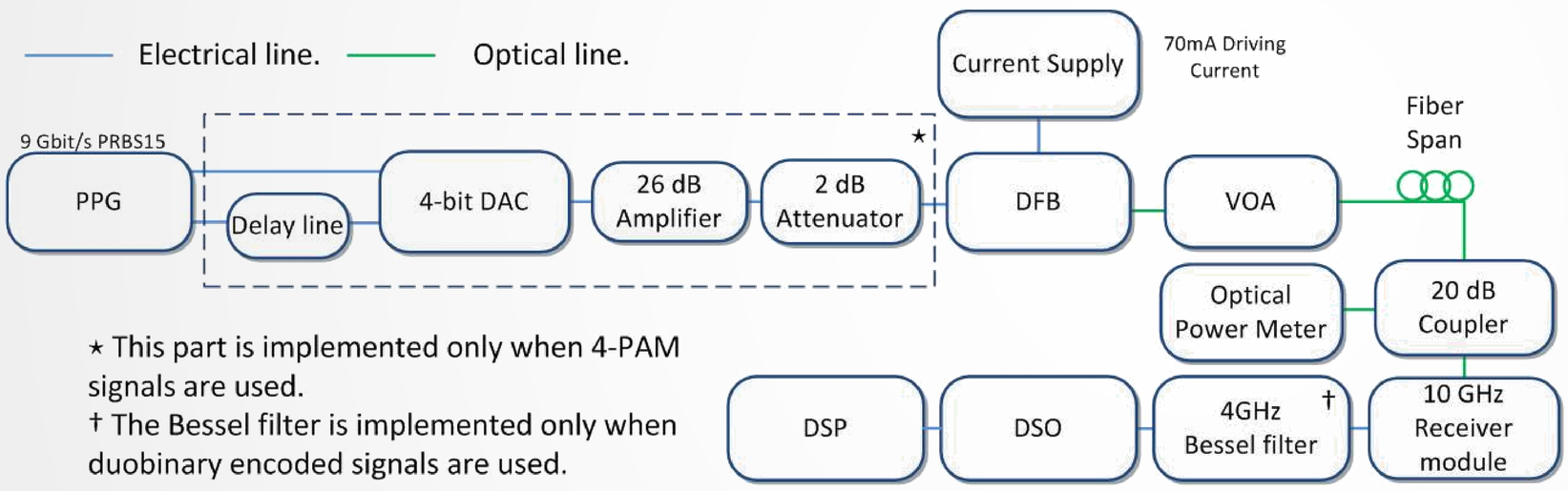
- Reports from Cisco states that metro network only traffic will surpass that of Long haul network traffic.
- Optical metro networks needs an upgrade.
  - –Mainly limited by low electrical bandwidth.
- Discrete Multi Tone (**DMT**) and Orthogonal Frequency Division Multiplexing (**OFDM**) is being considered.
  - –Requires large amounts of Digital Signal Processing (**DSP**).

Scenario



- Maximum transmission distance of 20 km.
- Maximum electrical bandwidth 10 GHz.
- Maximum symbol rate <10 Gbaud.

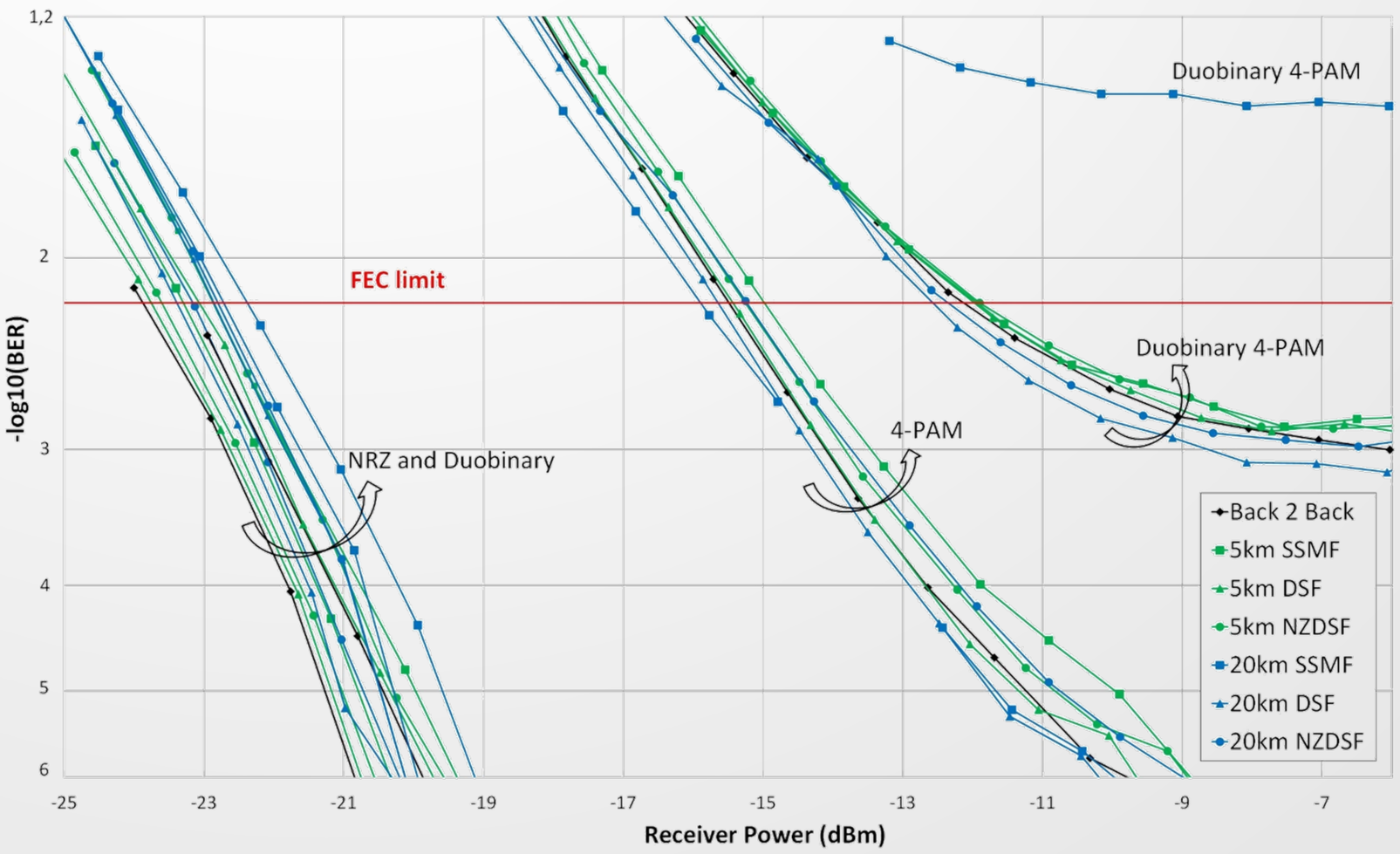
Experimental Setup



Conclusion

- **Duobinary** performes on pair with NRZ.
  - –**Duobinary** can be implemented with no significant penalty in received power.
- With access networks designed for 10 Gbps, we are able to transmit 18 Gbps **4-PAM** below the **FEC** limit.
- The **4-PAM** signal can be filtered by a 4 GHz Bessel filter, creating a **Duobinary 4-PAM** singnal.
  - –Preforming below **FEC** for **DSF** and **NZDSF** up to 20 km.
  - –Only 3 dB power penalty to the received power.

Experimental Results



想要了解更多实验结果，及其他激动人心的实验，请参观丹麦技术大学在丹麦馆的展位，一号厅，1A06号展位。